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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/938,399	08/23/2001	Michael Barnes	A4944/139900	9940

32588 7590 05/19/2003

APPLIED MATERIALS, INC.  
2881 SCOTT BLVD. M/S 2061  
SANTA CLARA, CA 95050

EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

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DATE MAILED: 05/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/938,399

Applicant(s)

BARNES ET AL.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 2/28/03
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15, 24 and 25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15, 24 and 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3 and 6-10 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,451,118 to Garriga in view of U.S. Patent No. 5,578,130 to Hayashi et al.
3. Garriga discloses an apparatus for processing semiconductor substrates in Figure 5 substantially as claimed, the apparatus comprising: a first atmospheric deposition station (552; column 6, rows 48-54); a second atmospheric deposition station (556) comprising an atmospheric pressure vapor deposition chamber (column 5, rows 45-49 and column 6, rows 34-38), wherein the first atmospheric station and the second atmospheric deposition station are coupled together; and a substrate handling system (516 and 518) adapted to transfer substrates between the first atmospheric deposition station and the second atmospheric deposition station. Examiner has arbitrarily picked numbers for the processing chambers above from the chambers illustrated in Figure 5a, as Garriga teaches that any of the chambers may be constructed to perform the processes set forth in the disclosure.
4. With respect to claim 3, any of the four atmospheric deposition stations may be configured to comprise an ultrasonic spray deposition device (column 5, rows 55-57).
5. With respect to claim 6, any of the processing stations (atmospheric or vacuum ) could be used as a curing station (column 5, rows 50-54 and column 6, rows 5-6). Although the "curing station" is described as a "heating" station by Garriga, it can also be considered to be a curing chamber, where "cure" is defined by Merriam-Webster as "to prepare or alter especially by chemical or physical processing for keeping or use".
6. With respect to claim 7, the substrates processed are semiconductor substrates (claim 16).

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7. With respect to claim 8, the courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex Parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

8. With respect to claim 9, the atmospheric vapor deposition chamber is an atmospheric chemical vapor deposition chamber (column 5, rows 45-49).

9. With respect to claim 10, though not explicitly disclosed, the first atmospheric deposition station would inherently comprise a liquid dispenser for any liquid treatment to be performed on the substrate (column 5, rows 40-44 and column 5, rows 29-33).

10. However, Garriga fails to teach a plasma system associated with the atmospheric deposition chamber.

11. Hayashi et al. teach the use of a plasma system associated with an atmospheric chemical vapor deposition system for the purpose forming coatings for hardening or improving the surface of plastic, glass, or an organic photo sensitive body, or for the prevention of reflection of a surface (column 1, rows 45-60).

12. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a plasma system associated with the an atmospheric chemical vapor deposition system in Yamada et al. in order to form coatings for hardening or improving the surface of plastic, glass, or an organic photo sensitive body, or for the prevention of reflection of a surface as taught by Hayashi et al.

13. Claims 2, 11, 13-15 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garriga and Hayashi et al. as applied to claims 1, 3 and 6-10 above, and further in view of U.S. Patent No. 5,562,772 to Neoh.

14. Garriga and Hayashi et al. disclose the invention substantially as claimed and as described above.

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15. Additionally, with respect to claim 11, Garriga discloses an apparatus for processing semiconductor substrates, the apparatus comprising: an atmospheric chemical vapor deposition chamber (556); a coating chamber (552) coupled to the atmospheric chemical vapor deposition chamber; a curing station (any one of 520, 522, 524 or 526) coupled to the atmospheric chemical vapor deposition chamber; and a substrate handling system (516 and 518) adapted to transfer substrates between the atmospheric chemical vapor deposition chamber, the coating chamber and the curing station.
16. With respect to claim 13, the substrate handling system comprises a plurality of substrate handlers (516 and 518) with arms.
17. With respect to claim 14, the apparatus is a cluster tool (abstract).
18. With respect to claim 15, the courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex Parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).
19. With respect to claim 25, said apparatus further comprises an annealing chamber (554), a silylation chamber (550) and a curing chamber (any one of 520, 522, 524 or 526). Garriga
20. However, Garriga fails to teach the first atmospheric deposition station (of claim 1) or the coating station (of claim 11) housing a spin coater.
21. Neoh teaches the use of a spin coater for the purpose of forming a coating layer that has uniform thickness and is substantially free of bubbles (column 1, rows 60-64).
22. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to provided a spin coater in the atmospheric deposition chamber in the prior art in order to form a coating layer that has uniform thickness and is substantially free of bubbles as taught by Neoh.
23. Claims 5 and 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garriga and Hayashi et al. as applied to claims 1, 3 and 6-10 above, and further in view of U.S. Patent No. 5,337,362 to Imahashi.

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24. Garriga and Hayashi et al. disclose the invention substantially as claimed and as described above. Additionally with respect to claim 24, the substrates are semiconductor substrates (see claim 16), the atmospheric deposition chamber is an APCVD chamber (column 5, rows 45-49) and the apparatus further comprises a curing station (520, 522, 524 or 526) coupled to the first and second atmospheric deposition stations.

25. However, the prior art fails to teach a remote plasma system adapted to generate a plasma upstream of the atmospheric chemical vapor deposition chamber.

26. Imahashi et al. teach the use of a remote plasma system associated with a deposition chamber in a multiple chamber system for the purpose of preventing ions from being supplied to the deposition chamber and causing damage to a substrate (column 2, rows 42-47 and column 6, rows 14-34).

27. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a remote plasma system in the prior art in order to prevent ions from being supplied to a deposition chamber and causing damage to a substrate as taught by Imahashi et al.

28. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garriga, Hayashi et al. and Neoh as applied to claims 2, 11 and 13-15 above, and further in view of U.S. Patent No. 5,337,362 to Imahashi.

29. The prior art discloses the invention substantially as claimed and as described above.

30. However, the prior art fails to teach a remote plasma system adapted to generate a plasma upstream of the atmospheric chemical vapor deposition chamber.

31. Imahashi et al. teach the use of a remote plasma system associated with a deposition chamber in a multiple chamber system for the purpose of preventing ions from being supplied to the deposition chamber and causing damage to a substrate (column 2, rows 42-47 and column 6, rows 14-34).

32. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a remote plasma system in the prior art in order to prevent ions from being supplied to a deposition chamber and causing damage to a substrate as taught by Imahashi et al.

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33. Claims 1-2, 6-11 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,501,739 to Yamada et al. in view of U.S. Patent No. 5,578,130 to Hayashi et al.

34. Yamada et al. disclose an apparatus for processing semiconductor substrates in Figure 1, the apparatus comprising: a first atmospheric deposition station (37; column 4, rows 11-15); a second atmospheric deposition station (26, column 3, rows 17-32) comprising an atmospheric pressure vapor deposition chamber, wherein the first atmospheric station and the second atmospheric deposition station are coupled together (chambers form an in-line apparatus); and a substrate handling system (23) adapted to transfer substrates between the first atmospheric deposition station and the second atmospheric deposition station.

35. With respect to claim 2, the first atmospheric deposition station comprises a spin coating chamber (column 4, row 66 through column 5, row 3).

36. With respect 6, the apparatus further comprises curing stations (24 and 30; column 3, rows 20-22 and 39-41). Although the chambers are described as a heating and a cooling chamber by Yamada, they can also be considered to be curing chambers, where "cure" is defined by Merriam-Webster as "to prepare or alter especially by chemical or physical processing for keeping or use".

37. With respect to claim 7, the substrates processed are semiconductor substrates (column 1, rows 6-10).

38. With respect to claim 8, the courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex Parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

39. With respect to claim 9, the atmospheric vapor deposition chamber is an atmospheric chemical vapor deposition chamber (column 3, rows 17-18).

40. With respect to claim 10, the first atmospheric deposition station comprises a liquid dispenser (61; column 4, row 66 through column 5, row 3).

41. With respect to claim 14, Yamada et al. further disclose the apparatus configured as a cluster tool in Figure 8.

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42. With respect to claim 15, as noted above, the courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex Parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).
43. However, Yamada et al. fails to teach a plasma system associated with the atmospheric chemical vapor deposition chamber.
44. Hayashi et al. teach the use of a plasma system associated with an atmospheric chemical vapor deposition system for the purpose forming coatings for hardening or improving the surface of plastic, glass, or an organic photo sensitive body, or for the prevention of reflection of a surface (column 1, rows 45-60).
45. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a plasma system associated with the an atmospheric chemical vapor deposition system in Yamada et al. in order to form coatings for hardening or improving the surface of plastic, glass, or an organic photo sensitive body, or for the prevention of reflection of a surface as taught by Hayashi et al.
46. Claims 5, 12 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. and Hayashi et al. as applied to claims 1-2, 6-11 and 14-15 above, and further in view of U.S. Patent No. 5,337,362 to Imahashi.
47. The prior art discloses the invention substantially as claimed and as described above.
48. However, the prior art fails to teach a remote plasma system adapted to generate a plasma upstream of the atmospheric chemical vapor deposition chamber.
49. Imahashi et al. teach the use of a remote plasma system associated with a deposition chamber in a multiple chamber system for the purpose of preventing ions from being supplied to the deposition chamber and causing damage to a substrate (column 2, rows 42-47 and column 6, rows 14-34).



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50. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a remote plasma system in the prior art in order to prevent ions from being supplied to a deposition chamber and causing damage to a substrate as taught by Imahashi et al.

51. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. and Hayashi et al. as applied to claims 1-2, 6-11 and 14-15 above, and further in view of U.S. Patent No. 5,151,008 to Ishida et al.

52. The prior art discloses the invention substantially as claimed and as described above.

53. However, the prior art fails to teach a substrate handling system comprising a plurality of substrate handlers with arms.

54. Ishida et al. teaches the use of a substrate handling system comprising a plurality of substrate handlers with arms for the purpose of providing a substrate handling system which is capable of efficiently conducting a transfer operation for substrates such as semiconductor wafers within the processing equipment without reciprocatingly moving the transfer handlers many times and causing the processing time to become long (column 1, rows 39-43 and column 1, row 65 through column 2, row 10).

55. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a substrate handling system with a plurality handlers in the prior art in order to provide a substrate handling system capable of efficiently conducting a transfer operation without reciprocatingly moving the transfer handlers many times causing the processing time to become long as taught by Ishida et al.

#### ***Response to Arguments***

57. 112 rejections are withdrawn.

58. Applicant's arguments filed 02/28/03 have been fully considered but they are not persuasive. Applicant argues that the combination of Yamada et al. and Hayashi et al. is improper because the two references teach away from each other. Specifically, Applicant argues that Yamada et al. is concerned with forming high purity coatings, while Hayashi is not. Examiner disagrees. Hayashi et al. specifically

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state at column 1, lines 52-54 that a best compromise must be struck between performance and cost. This would indicate that Hayashi et al. recognize and appreciate the advantages of an apparatus capable of forming high quality coatings. While Hayashi et al. disclose that an atmospheric deposition apparatus may be used to form coatings where impurity is not the one and only concern, that does not lead one to the conclusion that impurities formed in coatings are not of concern to Hayashi et al. By no means, does Hayashi et al. teach away from forming high quality coatings. Rather, the entire disclosure attempts to illustrate an apparatus that is capable of marrying the two objectives of optimizing performance/quality and avoiding high costs (see also column 2, rows 52-56). This is a common motivation in industry. The invention of Hayashi et al. is an improved plasma atmospheric deposition apparatus that forms higher quality films without incurring exorbitant costs.

### **Conclusion**

59. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

60. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km  
May 14, 2003

  
GREGORY MILLS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700